We claim:

    1. A method of producing high-surface area texturing of a surface of a substrate, comprising subtracting material from, adding material to, or both subtracting material from and adding material to the surface of a substrate using a subtractive method, an additive method, or both a subtractive method and an additive method to produce high-surface area texturing of the surface.

    2. The method of claim 1, wherein the method is a subtractive method.

    3. The method of claim 1, wherein the method is an additive method.

    4. The method of claim 2, wherein the subtractive method is a lithographic method.

    5. The method of claim 4, wherein the lithographic method is selected from the group consisting of a direct feature definition method, an intrinsic feature definition method, a secondary masking method, a deposit-and-pattern method, and combinations thereof.

    6. The method of claim 5, wherein the lithographic method is a direct feature definition method.

    7. The method of claim 5, wherein the lithographic method is an intrinsic feature definition method.

    8. The method of claim 7, wherein the feature definition method comprises exposing the surface of a laser-ablatable substrate to a source of laser light.

9. The method of claim 8, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

10. The method of claim 9, wherein the laser ablation mask is selected from the group consisting of a laser-light transmissive material comprising laser-light opaque material applied thereto, a laser-light transmissive material comprising laser-light partially transmissive material applied thereto, a laser-light transmissive material comprising laser-light opaque material embedded therein, a laser-light transmissive material comprising laser-light partially transparent material embedded therein, or a laser-light transmissive material comprising a combination of laser-light opaque material applied thereto, laser-light partially transmissive material applied thereto, laser-light opaque material embedded therein, and laser-light partially transparent material embedded therein.

11. The method of claim 10, wherein the laser ablation mask is a dot grayscale mask, a line-and-space grayscale mask or a combination thereof.

12. The method of claim 11, wherein the laser ablation mask is a dot grayscale mask comprising dots selected from the group consisting of opaque dots, transmissive dots, partially transmissive dots, and combinations thereof,

13. The method of claim 11, wherein the laser ablation mask is a line-and-space grayscale mask comprising lines selected from the group consisting of opaque lines, transmissive lines, partially transmissive lines, and combinations thereof,

14. The method of claim 8, wherein the exposing of the surface of the substrate is selected from the group consisting of scanning the source of laser light over the surface of the substrate, exposing the surface to laser light using a step-and-repeat

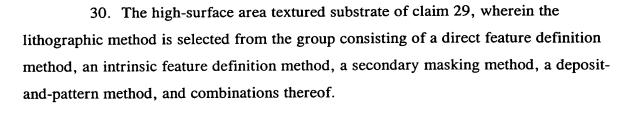protocol, subjecting the substrate to multiple exposures of laser light, and combinations thereof.

15. The method of claim 14, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

16. The method of claim 15, wherein the substrate is subject to multiple exposures of laser light and for each of the multiple exposures, the same or a different laser ablation mask, or a combination thereof, is used to define the pattern of the light incident on the surface of the substrate.

17. The method of claim 8, wherein a selected area of the substrate is exposed to the source of laser light.

18. The method of claim 17, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

19. The method of claim 18, wherein the high-surface area texturing is homogeneous texturing or heterogeneous texturing.

20. The method of claim 19, wherein the high-surface area texturing is heterogeneous texturing and further wherein the heterogeneous texturing is selected from the group consisting of continuous heterogeneous texturing and discontinuous heterogeneous texturing.

21. The method of claim 2, wherein the subtractive method is a nonlithographic method selected from the group consisting of a laser-assisted chemical etching method and a local roughening method

22. The method of claim 3, wherein the additive method is selected from the group consisting of adsorbing material to the surface of the substrate, adhering material to the surface of the substrate, bonding material to the surface of the substrate, precipitating material onto the surface of the substrate, and combinations thereof.

23. A high-surface area textured substrate prepared by a process comprising subtracting material from, adding material to, or both subtracting material from and adding material to the surface of a substrate using a subtractive method, an additive method, or both subtractive and additive methods, respectively, to produce high-surface area texturing of the surface.

24. The high-surface area textured substrate of claim 23, wherein the substrate is selected from the group consisting of polymeric materials, ceramic materials, glass materials, metal materials, composites thereof and laminates thereof.

25. The high-surface area textured substrate of claim 23, wherein the substrate is a laser-ablatable substrate.

26. The high-surface area textured substrate of claim 25, wherein the laser-substrate comprises a polyimide.

27. The high-surface area textured substrate of claim 23, wherein the method is a subtractive method.

28. The high-surface area textured substrate of claim 23, wherein the method is an additive method.

29. The high-surface area textured substrate of claim 27, wherein the subtractive method is a lithographic method.

30. The high-surface area textured substrate of claim 29, wherein the lithographic method is selected from the group consisting of a direct feature definition method, an intrinsic feature definition method, a secondary masking method, a deposit-and-pattern method, and combinations thereof.

31. The high-surface area textured substrate of claim 30, wherein the lithographic method is a direct feature definition method.

32. The high-surface area textured substrate of claim 30, wherein the lithographic method is an intrinsic feature definition method.

33. The high-surface area textured substrate of claim 32, wherein the feature definition method comprises exposing the surface of a laser-ablatable substrate to a source of laser light.

34. The substrate of claim 33, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

35. The substrate of claim 34, wherein the laser ablation mask is selected from the group consisting of a laser-light transmissive material comprising laser-light opaque material applied thereto, a laser-light transmissive material comprising laser-light partially transmissive material applied thereto, a laser-light transmissive material comprising laser-light opaque material embedded therein, a laser-light transmissive material comprising laser-light partially transparent material embedded therein, or a laser-light transmissive material comprising a combination of laser-light opaque material applied thereto, laser-light partially transmissive material applied thereto, laser-light opaque material embedded therein, and laser-light partially transparent material embedded therein.

36. The substrate of claim 35, wherein the laser ablation mask is a dot grayscale mask, a line-and-space grayscale mask or a combination thereof.

37. The substrate of claim 36, wherein the laser ablation mask is a dot grayscale mask comprising dots selected from the group consisting of opaque dots, transmissive dots, partially transmissive dots, and combinations thereof.

38. The substrate of claim 36, wherein the laser ablation mask is a line-and-space grayscale mask comprising lines selected from the group consisting of opaque lines, transmissive lines, partially transmissive lines, and combinations thereof,

39. The substrate of claim 33, wherein the exposing of the surface of the substrate is selected from the group consisting of scanning the source of laser light over the surface of the substrate, exposing the surface to laser light using a step-and-repeat protocol, subjecting the substrate to multiple exposures of laser light, and combinations thereof.

40. The substrate of claim 39, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

41. The substrate of claim 40, wherein the substrate is subject to multiple exposures of laser light and for each of the multiple exposures, the same or a different laser ablation mask, or a combination thereof, is used to define the pattern of the light incident on the surface of the substrate.

42. The substrate of claim 33, wherein a selected area of the substrate is exposed to the source of laser light.

43. The substrate of claim 42, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

44. The substrate of claim 43, wherein the high-surface area texturing is homogeneous texturing or heterogeneous texturing.

45. The substrate of claim 44, wherein the high-surface area texturing is heterogeneous texturing and further wherein the heterogeneous texturing is selected from the group consisting of continuous heterogeneous texturing and discontinuous texturing.

46. The substrate of claim 27, wherein the subtractive method is a nonlithographic method selected from the group consisting of a laser-assisted chemical etching method and a local roughening method

47. The substrate of claim 28, wherein the additive method is selected from the group consisting of adsorbing material to the surface of the substrate, adhering material to the surface of the substrate, bonding material to the surface of the substrate, precipitating material onto the surface of the substrate, and combinations thereof.

48. A miniaturized analysis device prepared by a process comprising subtracting material from, adding material to, or both subtracting material from and adding material to the surface of a substrate using a subtractive method, an additive method, or both subtractive and additive methods, respectively, to produce high-surface area texturing of the surface.

49. The miniaturized analysis device of claim 48, wherein the substrate is selected from the group consisting of polymeric materials, ceramic materials, glass materials, metal materials, composites thereof and laminates thereof.

50. The miniaturized analysis device of claim 48, wherein the method is a subtractive method.

51. The miniaturized analysis device of claim 48, wherein the method is an additive method.

52. The miniaturized analysis device of claim 50, wherein the subtractive method is a lithographic method.

53. The miniaturized analysis device of claim 52, wherein the lithographic method is selected from the group consisting of a direct feature definition method, an intrinsic feature definition method, a secondary masking method, a deposit-and-pattern method, and combinations thereof.

54. The miniaturized analysis device of claim 53, wherein the lithographic method is a direct feature definition method.

55. The miniaturized analysis device of claim 53, wherein the lithographic method is an intrinsic feature definition method.

56. The miniaturized analysis device of claim 55, wherein the feature definition method comprises exposing the surface of a laser-ablatable substrate to a source of laser light.

57. The miniaturized analysis device of claim 56, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

58. The miniaturized analysis device of claim 57, wherein the laser ablation mask is selected from the group consisting of a laser-light transmissive material

comprising laser-light opaque material applied thereto, a laser-light transmissive material comprising laser-light partially transmissive material applied thereto, a laser-light transmissive material comprising laser-light opaque material embedded therein, a laser-light transmissive material comprising laser-light partially transparent material embedded therein, or a laser-light transmissive material comprising a combination of laser-light opaque material applied thereto, laser-light partially transmissive material applied thereto, laser-light opaque material embedded therein, and laser-light partially transparent material embedded therein.

59. The miniaturized analysis device of claim 58, wherein the laser ablation mask is a dot grayscale mask, a line-and-space grayscale mask or a combination thereof.

60. The miniaturized analysis device of claim 59, wherein the laser ablation mask is a dot grayscale mask comprising dots selected from the group consisting of opaque dots, transmissive dots, partially transmissive dots, and combinations thereof.

61. The miniaturized analysis device of claim 59, wherein the laser ablation mask is a line-and-space grayscale mask comprising lines selected from the group consisting of opaque lines, transmissive lines, partially transmissive lines, and combinations thereof,

62. The miniaturized analysis device of claim 56, wherein the exposing of the surface of the substrate is selected from the group consisting of scanning the source of laser light over the surface of the substrate, exposing the surface to laser light using a step-and-repeat protocol, subjecting the substrate to multiple exposures of laser light, and combinations thereof.
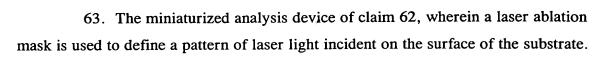
63. The miniaturized analysis device of claim 62, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

64. The miniaturized analysis device of claim 63, wherein the substrate is subject to multiple exposures of laser light and for each of the multiple exposures, the same or a different laser ablation mask, or a combination thereof, is used to define the pattern of the light incident on the surface of the substrate.

65. The miniaturized analysis device of claim 56, wherein a selected area of the substrate is exposed to the source of laser light.

66. The miniaturized analysis device of claim 65, wherein a laser ablation mask is used to define a pattern of laser light incident on the surface of the substrate.

67. The miniaturized analysis device of claim 66, wherein the high-surface area texturing is homogeneous texturing or heterogeneous texturing.

68. The miniaturized analysis device of claim 67, wherein the high-surface area texturing is heterogeneous texturing and further wherein the heterogeneous texturing is selected from the group consisting of continuous heterogeneous texturing and discontinuous heterogeneous texturing.

69. The miniaturized analysis device of claim 50, wherein the subtractive method is a nonlithographic method selected from the group consisting of a laser-assisted chemical etching method and a local roughening method

70. The miniaturized analysis device of claim 51, wherein the additive method is selected from the group consisting of adsorbing material to the surface of the substrate, adhering material to the surface of the substrate, bonding material to the

surface of the substrate, precipitating material onto the surface of the substrate, and combinations thereof.

71. A method for preparing a replicate copy of a high-surface area textured substrate, comprising using the high-surface area textured substrate of claim 23 as a master for preparing the copy.

72. The method of claim 71, wherein the master is used as a master mold.

73. The method of claim 71, wherein the master is used as a stamp.

74. A method for preparing a replicate copy of a miniaturized analysis device, comprising using the miniaturized analysis device of claim 48 as a master for preparing the replicate copy.

75. The method of claim 74, wherein the master is used as a master mold.

76. The method of claim 74, wherein the master is used as a stamp.

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